

CLAIMS

What is claimed is:

1. A method of forming a supported activator composition comprising combining (a) a halogenated aromatic aluminum activator compound with (b) a fluorinated support and a catalyst to form a supported activated catalyst composition; wherein the fluorinated support possesses from 0.001 mmol OH/g inorganic oxide to 1 mmol OH/g inorganic oxide.
2. The method of Claim 1, further comprising the step of removing the reaction products resulting from the combination of (a) and (b).
3. The method of Claim 2, further comprising combining a catalyst compound to form a supported activated catalyst composition.
4. The method of Claim 3, wherein the catalyst compounds are selected from metallocenes and Group 15-containing catalyst compounds.
5. The method of claim 1, wherein the halogenated aromatic aluminum activator compound comprises at least two fluorine atoms.
6. The method of claim 1, wherein the halogenated activator compound comprises a tetrafluoro compound or a trifluoro compound.
7. The method of claim 1, wherein the halogenated aromatic aluminum activator compound has the formula $R_nAl(ArHal)_{3-n}$, wherein ArHal is a halogenated aryl group, R is a monoanionic ligand, and n is 1 or 2.
8. The method of claim 3, wherein the supported activated catalyst composition comprises no more than 0.001 mmol OH/g silica.
9. The method of claim 3, wherein the supported activated catalyst includes aluminum in an amount of from 2 wt% to 0.35 wt%.

10. The method of claim 1, wherein the fluorinated support comprises from less than about 0.1 mmol OH/g silica after combination with the halogenated aromatic aluminum activator.
11. The method of claim 1, wherein the fluorinated support is first formed by combining a fluorinating agent with the inorganic oxide at a temperature of from less than 700°C.
12. The method of claim 1, wherein the catalyst comprises a metallocene-type compound.
13. The method of claim 1, wherein the fluorinated support comprises an inorganic support selected from the group consisting of talc, clay, silica, alumina, magnesia, zirconia, iron oxides, boria, calcium oxide, zinc oxide, barium oxide thoria, aluminum phosphate gel, hydroxylated polyvinylchloride and hydroxylated polystyrene.
14. The method of claim 2, wherein the catalyst compound is combined with the halogenated aromatic aluminum activator compound prior to being combined with the fluorinated support.
15. The method of claim 2, wherein the catalyst is combined with the fluorinated support at the same time as the halogenated aromatic aluminum activator compound.
16. The method of Claim 1, wherein the halogenated aromatic aluminum activator compound is combined with the fluorinated support in an amount of from 1OH:1Al to 1OH:5Al (molar ratio).
17. A catalyst composition comprising the reaction product of a fluorinated support; a perfluorophenyl aluminum activator compound; and a metallocene catalyst.

18. The catalyst composition of claim 17, wherein the perfluorophenyl aluminum activator compound is bound to the fluorinated support.
19. The supported activated catalyst composition of claim 17, wherein the metallocene catalyst is combined with the perfluorophenyl aluminum activator compound after combining the perfluorophenyl aluminum activator with the fluorinated support.
20. A method of polymerizing olefins comprising combining:
 - (a) ethylene and optionally one or more C₃ to C₁₀ α-olefins; and
 - (b) a catalyst composition formed by combining:
 - (i) a halogenated aromatic aluminum activator compound, and
 - (ii) a fluorinated support and a catalyst to form a supported activated catalyst composition; wherein the fluorinated support possesses from 0.001 mmol OH/g inorganic oxide to 1 mmol OH/g inorganic oxide;
 - (iii) isolating a supported activator composition; then
 - (iv) combining the supported activator composition with a catalyst compound.
21. The method of Claim 20, wherein the catalyst compounds are selected from metallocenes and Group 15-containing catalyst compounds.
22. The method of claim 20, wherein the halogenated aromatic aluminum activator compound comprises at least two fluorine atoms.
23. The method of claim 20, wherein the halogenated activator compound comprises a tetrafluoro compound or a trifluoro compound.
24. The method of claim 20, wherein the halogenated aromatic aluminum activator compound has the formula R_nAl(ArHal)_{3-n}, wherein ArHal is a halogenated aryl group, R is a monoanionic ligand, and n is 1 or 2.

25. The method of claim 20, wherein the supported activated catalyst composition comprises no more than 0.001 mmol OH/g silica.
26. The method of claim 20, wherein the supported activated catalyst includes aluminum in an amount of from 2 wt% to 0.35 wt%.
27. The method of claim 20, wherein the fluorinated support comprises from less than about 0.1 mmol OH/g silica after combination with the halogenated aromatic aluminum activator.
28. The method of claim 20, wherein the fluorinated support is first formed by combining a fluorinating agent with the inorganic oxide at a temperature of from less than 700°C.
29. The method of claim 20, wherein the catalyst comprises a metallocene-type compound.
30. The method of claim 20, wherein the fluorinated support comprises an inorganic support selected from the group consisting of talc, clay, silica, alumina, magnesia, zirconia, iron oxides, boria, calcium oxide, zinc oxide, barium oxide thoria, aluminum phosphate gel, hydroxylated polyvinylchloride and hydroxylated polystyrene.
31. The method of claim 20, wherein the catalyst compound is combined with the halogenated aromatic aluminum activator compound prior to being combined with the fluorinated support.
32. The method of claim 20, wherein the catalyst is combined with the fluorinated support at the same time as the halogenated aromatic aluminum activator compound.

33. The method of Claim 20, wherein the halogenated aromatic aluminum activator compound is combined with the fluorinated support in an amount of from 1OH:1Al to 1OH:5Al (molar ratio).